CHAPTER 1
PURPOSE AND NEED FOR THE PROPOSED ACTION

North from County Road 95A toward County Road 18A in 1995.

Downstream from right bank at Olivers in 1995.

Highway 99, upstream of East Frontage Road in 1995.

CHAPTER 1.0

PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 Introduction

The Lower Cache Creek, Yolo County, California City of Woodland and Vicinity Draft Feasibility Report for Potential Flood Damage Reduction Project (Feasibility Report) addresses flooding problems in the lower reach of Cache Creek. This project is being prepared jointly by the Federal sponsor, the U.S. Army Corps of Engineers, Sacramento District (Corps), and the non-Federal sponsors, the Reclamation Board of the State of California (Board), and the City of Woodland.

The National Environmental Policy Act (NEPA) ensures that Federal agencies will consider the environmental effects of their actions. It also requires that an Environmental Impact Statement (EIS) be included in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment. The California Environmental Quality Act (CEQA) charges public agencies with avoiding or substantially reducing significant environmental damage where feasible. The Environmental Impact Report (EIR) is an informational document that informs public agency decision makers and the general public of the significant environmental effects of a proposed project. A cost-share agreement between the Corps and the Board has resulted in a joint EIS/EIR. The Corps is the lead agency under NEPA, and the Board is the lead agency under CEQA. The City of Woodland is a cooperating agency under CEQA.

This Draft EIS/EIR summarizes the results of the Feasibility Report. Chapter 1 is an overview of this environmental document, including information on the report's purpose, the authorization for the project, description of the project area, and the purpose and need for the project. It also includes a brief overview of the proposed project's background and history, and it identifies significant issues. Sections including the decisions to be made based on this analysis and the organization of this Draft EIS/EIR are also included.

1.2 Study Authority

The general authority for this investigation is provided by the Flood Control Act of 1962 (Public Law 87-874). In the Energy and Water Development Appropriations Act of 1993 (Public Law 102-377), Congress directed the Corps to conduct a "reconnaissance study of flooding problems in the westside tributaries, Putah and Cache Creeks, of Yolo Bypass." The reconnaissance study was initiated in April 1993 at the request of the Yolo County Board of Supervisors, and Federal interest was found in proceeding with a feasibility level-investigation of flood damage reduction along lower Cache Creek. A feasibility cost-share agreement between the Corps and the Board and a local feasibility

cost-share agreement between the Board and the City of Woodland were signed in January 2000.

1.3 Study and Project Area Location and Descriptions

The study area addressed in this report includes the entire Cache Creek watershed from the eastern foothills of the Coast Range to the western levees of the Yolo Bypass. The area includes parts of Yolo, Colusa, and Lake Counties (Figure 1-1). The focus of the report is flood damage reduction opportunities specific to the project area, which is the lower reach of Cache Creek and the city of Woodland in Yolo County (Figure 1-2).

Cache Creek originates below the outlet channel of Clear Lake on the western foothills of the Coast Range and is fed by North Fork Cache Creek (Indian Valley Dam and Reservoir) and Bear Creek on the northern slope of the upper watershed. The creek meanders from the upper watershed to the flat plain near Woodland and Yolo and ends at the settling basin near the Yolo Bypass, as shown on Figure 1-2. When there is adequate flow, Cache Creek is connected to the Sacramento River via the Yolo Bypass and a 400 cubic feet per second (cfs) low-flow culvert that passes through the east levee of the settling basin, south of the over flow weir. In addition to providing water and shelter for fish and wildlife, Cache Creek is a source of water for domestic use, farming, cattle grazing, gravel mining, other industrial uses, and recreation. The creek is owned primarily by private parties and is not considered a navigable waterway of California.

Within the last 100 years, the creek has experienced dramatic human-induced and natural changes. The natural changes include shifting of the stream channel as a result of eroding banks and storms; eroding soil from the upper watershed; and poor water quality due to boron, mercury, and other naturally occurring chemicals. During periods of heavy runoff, the creek carries a significant sediment load, requiring the use of the settling basin to protect the Yolo Bypass from filling in with sediment. The human-induced changes include channel and levee work for flood damage reduction and irrigation, gravel mining within the channel, agricultural runoff, soil erosion due to over use and livestock in the rangeland portion of the creek, and nonnative plant introduction of species such as tamarisk and giant reed.

1.4 Hydrology in Project Area

The project area includes the lower planar reach of Cache Creek. This encompasses gravel mining and agricultural areas, the city of Woodland, the town of Yolo, and the settling basin. Prior to significant gravel mining, Cache Creek is described as being a wide, relatively steep braided channel upstream from Yolo and a narrow, incised channel flowing in fine-grained overbank deposits and tule marsh downstream from Yolo (EIP Associates, 1995). In general, average channel width in gravel-mined reaches of Cache Creek has decreased from this historic condition due to bridge and levee construction and aggregate extraction. Conversely, average channel depths have increased as a result of channel degradation and confinement by levees and bridges. General comments regarding the geomorphic characteristics of the project area are listed below:

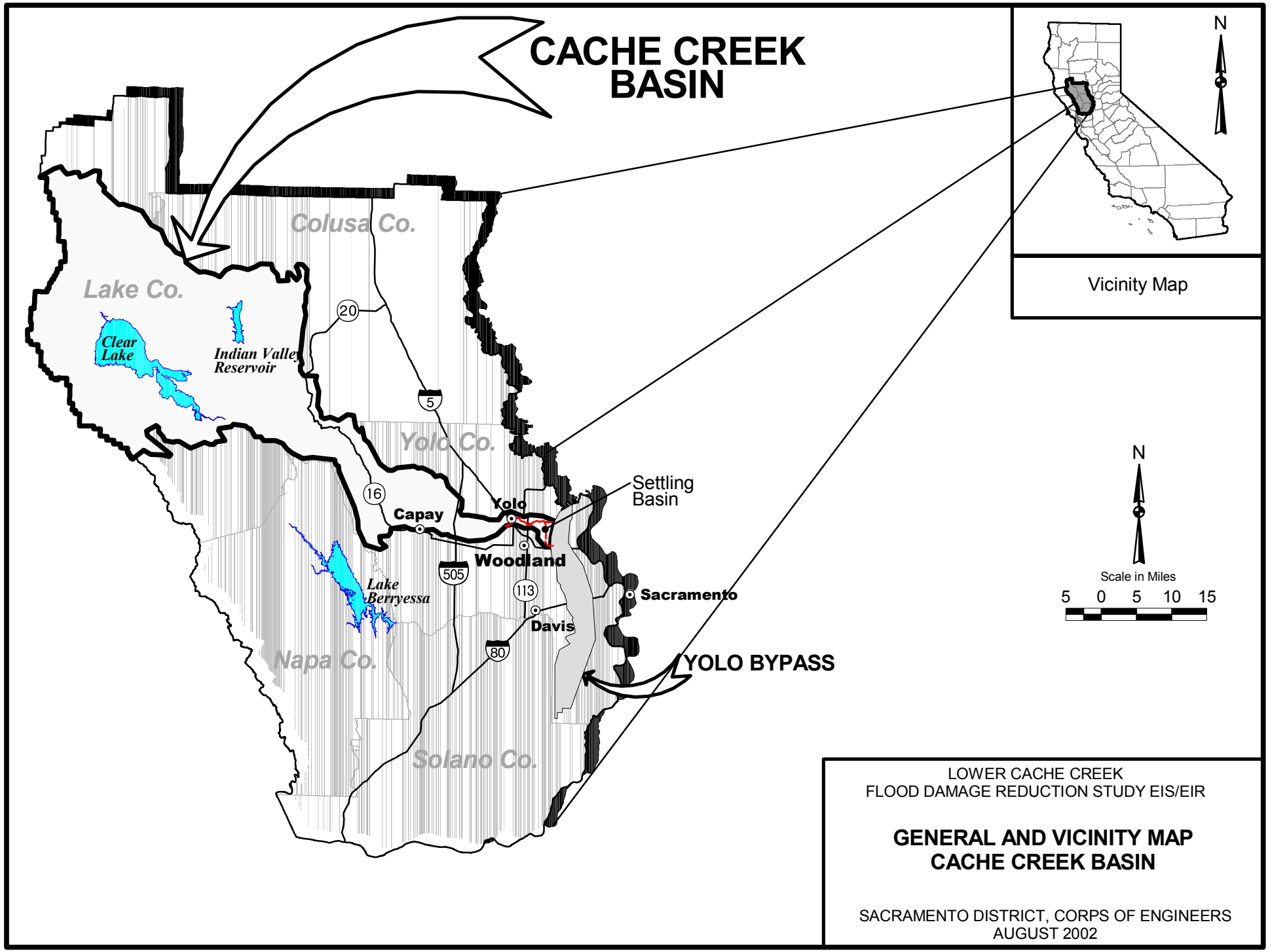
CACHE CREEK BASIN
Colusa Co.
Lake Co.
Clear Lake
Indian Valley Reservoir
20
5
Yolo Co.
16
Capay
Yolo
Settling Basin
Woodland
505
113
Davis
Sacramento
Lake Berryessa
80
Napa Co.
YOLO BYPASS
Solano Co.
N
Vicinity Map
N
Scale in Miles
5 0 5 10 15
LOWER CACHE CREEK
FLOOD DAMAGE REDUCTION STUDY EIS/EIR
GENERAL AND VICINITY MAP
CACHE CREEK BASIN
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
AUGUST 2002

Figure 1-1

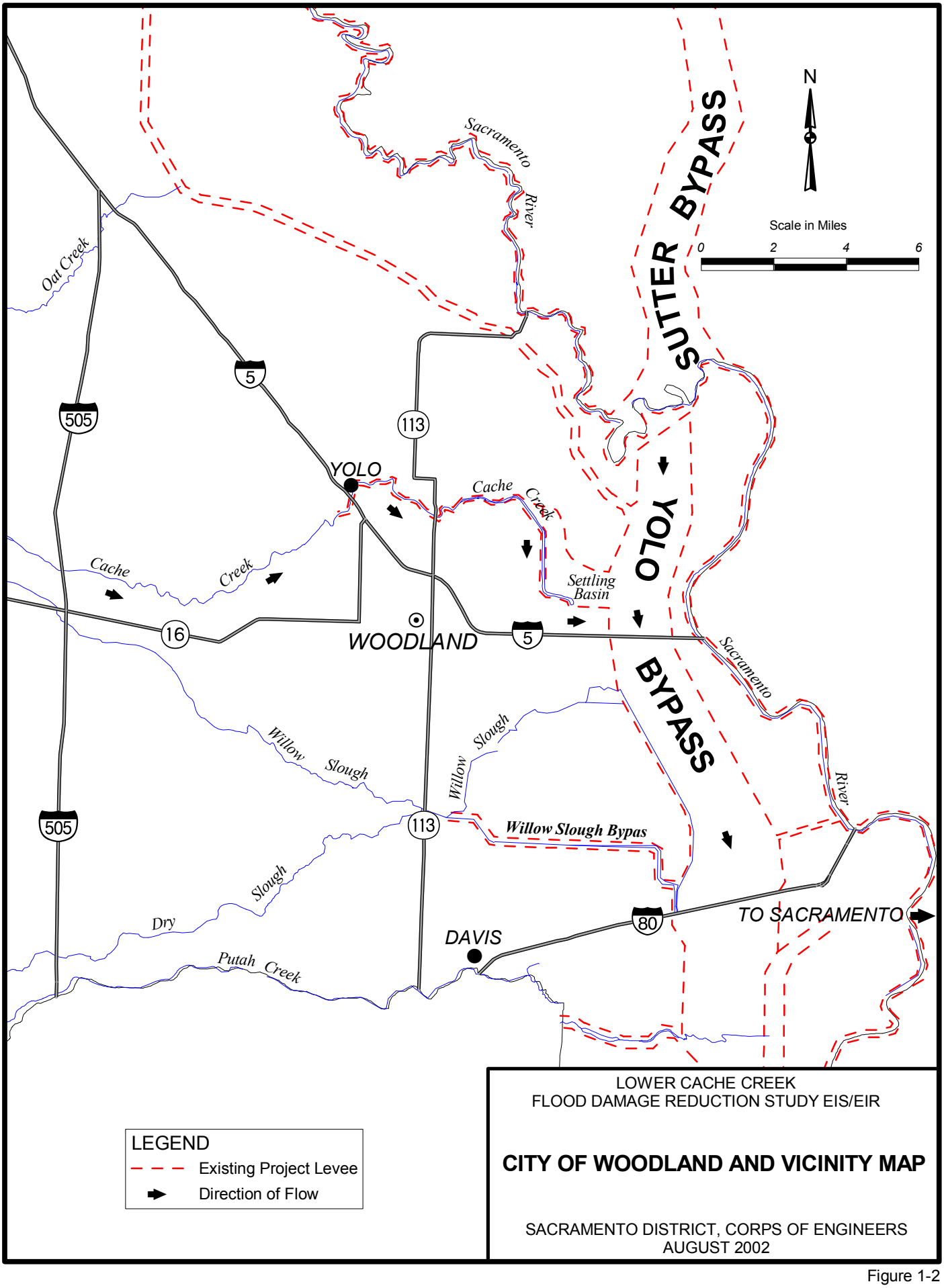
N
Scale in Miles
0 2 4 6
SUTTER BYPASS
YOLO BYPASS
Sacramento River
Oat Creek
5
505
113
YOLO
Cache Creek
Settling Basin
Cache Creek
16
WOODLAND
5
Sacramento River
Willow Slough
Willow Slough
505
113
Willow Slough Bypas
Slough
Dry
80
TO SACRAMENTO
DAVIS
Putah Creek
LEGEND
Existing Project Levee
Direction of Flow
LOWER CACHE CREEK
FLOOD DAMAGE REDUCTION STUDY EIS/EIR
CITY OF WOODLAND AND VICINITY MAP
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
AUGUST 2002

Figure 1-2

- Stream gradient on lower Cache Creek varies from about 0.0015 upstream from I-5 to about 0.00011 near the settling basin.

- The active channel width appears to have decreased since 1937. However, the course of the creek has remained relatively constant.

- Cache Creek exhibits a widening trend with distance upstream from the Interstate 5 (I-5) bridge.

- The frequency and severity of bank erosion and bank instability in the project area increases with distance upstream from the settling basin (with exception to the gravel mines). Likewise, channel bed lowering increases with distance upstream from the settling basin. The channel head has lowered 4 to 26 feet since 1955. This has resulted in channel banks that are generally higher, steeper, and more prone to bank erosion and instability with distance upstream.

- Bank instability is characterized primarily by areas of active bank erosion and by bank slumping. Areas of active bank erosion typically exhibit nearly vertical banks of exposed sediment, indicative of recent erosion. Bank slumping is evidenced by single or multiple vertical scarps (2 to 3 feet high) at varying levels on the bank slope, indicating slumping and subsequent erosion of the down slope segment of the bank.

- Historically, numerous bank protection projects have been constructed, primarily in river bends. Thus, bank stability in these areas is due to artificial bank protection rather than inherent stream stability. Future maintenance of existing and construction of new bank protection projects would be necessary in the project area, for without-project conditions.

According to the April 2001 FEMA Flood Insurance Study, the city of Woodland has no recorded history of flooding. However, in 1958, 1983, and 1995, Cache Creek rose to the top of both levees and overflowed its banks toward the city of Woodland. In 1995, the overland flow came within 1 block of Woodland. In 1983, overland flow flooded areas in the easterly part of what is now within the city limits of Woodland. According to the USGS, the peak flow in January 1983 at the Rumsey gage was estimated to be 53,000 cfs, which is a 1 in 50 chance event at this location. There was a levee break downstream from County Road CR 102 during this flood. Federal, State, and local agencies patched levee boils at that time to prevent additional levee breaks along both sides of the Cache Creek levee system.

Upon levee failure, the distribution of the sheet flow would vary depending on the location of failure. For purpose of discussion, the project area has been divided into four sections: area north of Cache Creek, agricultural plain east of I-5, agricultural area west of I-5, and the existing Woodland storm drainage system.

1.4.1 The Area North of Cache Creek

The area north of Cache Creek includes the town of Yolo and many agricultural fields. Existing levees are maintained from I-5 to the settling basin. Floodwaters that exceed the existing levee system flow to the northeast toward Knights Landing and the Yolo Bypass. Under current conditions, the town of Yolo would have reliable protection from floods that have a 1 in 10 chance of occurring in any given year and less reliable protection for floods that have up to a 1 in 20 chance of occurring in any given year.

1.4.2 The West Section

The west section includes the area between the intersection of County Road (CR) 94B and Cache Creek and where I-5 crosses the creek. Existing levees extend up approximately half of the left (north) bank and a smaller portion on the right (south) bank near I-5. Gravel has been mined since the 1930's from Capay to the town of Yolo (14.4 miles). This mining area comprises much of this section. Waters that overtop the right (south) levee flow southeast toward the city of Woodland. The elevated berm of I-5 initially serves as a hydraulic barrier, directing some of the water to the western section of Woodland. If floodwater exceeds the elevation of the highway, it would overtop the highway as it did during the 1995 flood event.

1.4.3 The East Section

The east section extends from the I-5 and railroad crossings to the outflow from the settling basin into the Yolo Bypass. The existing levee system borders the entire creek and the settling basin. Floodwaters that overtop the right bank of the existing levee system would flow southeast toward the eastern portion of Woodland.

The existing settling basin was constructed to minimize the adverse effect on the hydraulic capacity of the Yolo Bypass caused by excess sediment deposition by allowing sediment carried by Cache Creek to settle out before entering the Yolo Bypass. The settling basin is bounded by levees on all sides and covers 3,600 acres. The Corps originally constructed the basin in 1937. The levee heights and locations have been modified several times to control sediment deposition and increase sediment storage capacity.

In 1991, modifications to the settling basin included 50-year storage capacity with an average of 340 acre-feet of sediment accumulation per year. This corresponds to an average trapping efficiency of 55 percent, assuming existing levee project conditions and a Cache Creek channel conveyance of 30,000 cfs. Flows from Cache Creek enter the northwest corner of the settling basin and exit via two structures in the southeast corner of the basin: (1) a 1,700-foot concrete weir and (2) a grated 400-cfs double-box culvert low-flow outlet. The crest elevation of the weir is currently set at an approximate elevation of 35 feet (North American Vertical Datum of 1988, NAVD88), approximately 11 feet above ground surface downstream. It is planned that the weir would be raised 6 feet in 2017 or when the basin fills with sediment such that the trap efficiency decreases to less than 30 percent.

A training levee adjacent to the west levee of the settling basin ties into the end of the left levee of Cache Creek. The training levee was designed to direct the flow to the southern portion of the settling basin, maintaining the flow velocity and preventing sediment deposition and clogging near the inlet of the basin. At the release point of the training levee, the flow "spreads out," reducing the flow velocity and increasing sedimentation. The release point of the training levee is planned to be removed in increments, encouraging an even distribution of sediment deposition across the basin.

1.4.4 Existing Storm Drain System for the City of Woodland

The City of Woodland has evaluated the existing storm drainage system serving the city and the portions of Yolo County located between the city and the Cache Creek System. The purpose of the evaluation has been to identify existing storm drainage problems and to develop a storm drainage facilities master plan. These efforts only consider local runoff. The evaluation is presented in the report entitled "City of Woodland Storm Drainage Facilities Master Plan," December 1999, Borcalli and Associates.

In general, the storm drain system conveys runoff by gravity flow from west to east. The agricultural lands are served by a minimal drainage system, whereas the city is served by piped trunk systems. The trunk systems discharge into the North or the South Canals, conveying the runoff to the city's three pump stations. The pump stations discharge into the Outfall Channel, which conveys runoff to the Yolo Bypass.

The city's existing trunk system is inadequate to accept the runoff from the agricultural areas on the west and south sides of the city, resulting in overflow onto the city streets. Inadequate trunk capacity results in street flooding for floods with a 1 in 2 or 1 in 10 chance of occurring in any given year. The extent and magnitude of street flooding increases significantly between these events. When flows reaching the North Canal and South Canal Pump Stations exceed their pumping capacities, the results are high stages and ponding in the North and South Canals.

1.5 Purpose and Need for the Action

The Corps and the non-Federal cost-sharing partners are seeking to develop and implement a plan that would reduce flood damage to the City of Woodland resulting from flooding from lower Cache Creek. The purpose of this document is to consider the environmental effects in the decision making process and provide full disclosure of these effects to the public.

Lower Cache Creek has a history of flooding. Four major flood periods have been documented for the Cache Creek basin during the last half of the 20th century, and 20 severe floods have occurred since 1900. The most severe floods of recent years in the Cache Creek basin downstream from Clear Lake occurred in 1939,1955, 1956, 1958, 1964 and 1965, 1970, 1983, 1995, and 1997.

According to the April 2001 FEMA Flood Insurance Study, the city of Woodland has no recorded history of flooding. However, in 1958, 1983, and 1995, Cache Creek

rose to the top of both levees and overflowed its banks toward the cities of Woodland and Davis. In 1995, the overland flow came within 1 block of Woodland. In 1983, overland flow flooded areas in the easterly part of what is now in the city limits of Woodland. According to the USGS, the peak flow in January 1983 at the Rumsey gage was estimated to be 53,000 cfs, which is a 1 in 50 chance event at this location. There was a levee break downstream from County Road CR 102 during this flood. Federal, State, and local agencies patched levee boils at that time to prevent additional levee breaks along both sides of the Cache Creek levee system.

The peak flow at CR 94B in January 1995 was approximately 48,000 cfs. An estimated 3,800 cfs overflowed the south bank and almost nothing overflowed the north bank upstream of the levee system. The total flow (approximately 48,000 cfs, peak) represents a 1 in 40 chance event. The volume of the flood hydrograph was approximately a 1 in 20 chance event. The City of Woodland observed and prepared a sketch of high-water marks in the vicinity of the city of Woodland for the March 1995 event. These observations do not define the full extent of the flood boundary.

Without a flood damage reduction project, annual damages to real property from overflows from Cache Creek would be expected to continue to be about $12 million. Other losses or adverse effects would continue to include the potential for flood-related loss of life, contamination from sanitary sewage and hazardous materials, and the extended closure of the section of I-5 east of the city of Woodland.

The city of Woodland and surrounding local areas seek to reduce pending flood hazards. The purpose of the Lower Cache Creek Potential Flood Damage Reduction Project is to provide an economically feasible and environmentally sensitive method to alleviate flood-related damages.

1.6 Significant Issues

Significant issues for the purpose of this Draft EIS/EIR are defined as topics that were taken into account during the development of the alternative plans. Hydrology, land use, transportation, environmental constraints, and public support are factors that influenced the project feasibility.

Currently, the creek channel and existing levee system do not provide a sufficient conveyance capacity to provide protection from floods that have a 1 in 100 chance of occurring in any given year for the city of Woodland. Without this protection, citizens within the 1 in 100 chance flood plain (as mapped by FEMA) would be required to obtain flood insurance. If the existing levee system fails or overtops, the elevated grades of I-5 and the California Northern Railroad, in addition to the west levee of the settling basin, would direct the escaped floodwaters toward the city of Woodland, causing further financial burdens associated with the lack of flood protection.

The primary objective of this project is to improve flood protection to the city of Woodland. This city is the most highly populated, urban, commercial, and industrial development in the study area. The population of Woodland is projected to continue

growing at approximately 2 percent per year. However, the recent designation of the city within the FEMA 1 in 100 chance flood plain now requires new developments to be in accordance with the Federal Flood Insurance Program. This significantly increases development costs.

Unincorporated private agricultural lands comprise approximately 60% of the project area. Construction of a new flood protection system would require takings of some private agricultural land. Furthermore, the placement of this system would also influence the location and amount of land provided with flood protection; some areas would be removed from the FEMA 1 in 100 chance flood plain. Modifications and/or relocation of buildings may be required for structures within the unprotected flood plain.

Other constraints include the bridges in the project area. The current levee system, which is adjacent to the terminus of the bridges, prevents flooding along the roadways for equal or lesser flows than for the flow that has a 1 in 20 chance of occurring in any given year[1]. A new flood protection system offering a higher degree of protection by containing the flow in the creek would have to comply with the current dimensions of the bridges for this flood protection to continue and the existing bridge to be maintained. The relatively narrow openings of these bridges constrict the flood plain within the proximity of the bridges, resulting in relatively high flow velocities through these narrow sections during flooding. Consequently, if the roadways and bridges are to be protected, rock slope protection is required for these narrow openings.

Rock slope protection (riprap) in addition to other alterations near the bank of the creek would require environmental mitigation. The shaded riverine aquatic habitat (SRA) along the creek and the abundant number of elderberry bushes along the creek bank (the habitat of the endangered valley elderberry longhorn beetle), increase the sensitivity of this area. Other environmental considerations include the presence of habitat within the project area for the following potentially affected species: giant garter snake, Swainson's hawk, bank swallow, northwestern pond turtle, Central Valley steelhead, and chinook salmon.

Public opinions and concerns were identified during two public workshops held on May 30, 2000 and May 31, 2001. Since that point, the alternative plans have been modified in order to address public comment as well as comply with the above-mentioned significant issues.

1.7 The Decisions to be Made Based on This Analysis

The District Engineer of the Sacramento District of the Corps must decide whether or not to recommend that a plan described in this report be authorized for implementation as a Federal project, with modifications at the discretion of the Chief of Engineers. The City of Woodland must decide whether to implement the recommended plan.

[1] Although designed for a flow capacity of a 1 in 10 chance of occurring, the existing levee system has historically contained flow events of a 1 in 20 chance of occurring in any given year.

1.8 Organization of the Draft EIS/EIR

This report is organized into eight chapters:

- Chapter 1 is the introduction;
- Chapter 2 describes the plan formulation and alternative plans considered for this project;
- Chapter 3 discusses the existing environmental setting and baseline conditions;
- Chapter 4 discusses the effects of the proposed alternative plans on the affected environment and describes mitigation;
- Chapter 5 presents other required disclosures including public involvement and cumulative effects;
- Chapter 6 is the list of preparers;
- Chapter 7 lists the references; and
- Chapter 8 is the index.